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The Pinetum. The plants in the Pinetum have not before passed through the winter in better condition than they have this year. Even most of the species about which we are always more or less concerned are now in good condition. The most injured species is the short-leaved Pine of the southern states, *Pinus echinata.* This is a widely distributed and extremely valuable timber tree, ranging from Long Island and Staten Island, New York, to Florida and westward to Texas, Oklahoma, Arkansas and Missouri, being the principal timber Pine west of the Mississippi River. The largest plants in the Arboretum have been growing here since 1879 and were raised from seeds gathered in Missouri. The leaves have always suffered and are sometimes entirely killed, the trees producing a new crop, or the ends are killed as they have been during the past winter. The trees are poor and thin, and probably will never be of much value in New England for ornament or timber. The other conifer which has suffered during the winter is *Tsuga heterophylla,* one of the largest and most beautiful conifers of our northwest coast where it ranges from Alaska to Washington and California, and eastward to the western base of the Rocky Mountains of Idaho. The coast tree has often been planted in Europe with great success but it has not proved hardy in New England. We have grown, however, in a sheltered position on Hemlock Hill since 1898 plants gathered in Idaho which have generally grown well but during the past winter the leaves have been badly browned. Among other conifers of doubtful hardiness are the Japanese *Cryptomeria japonica, Picea Breweriana,* and *Libocedrus decurrens.* The Cryptomeria is one of the great trees of the world and the largest trees planted by man several centuries ago are some of this species in the avenue of this tree leading to the Tombs at Nikko in Japan. Outside of Japan, even in the most favored parts of Europe, it does not grow particularly well, and in New England it will never be more than a curiosity. *Picea Breweriana* is a large tree of northwestern California and southeastern Oregon. This is the last of the large conifers discovered in California and is still little known in gardens. The Arboretum plant is in a sheltered position on Hemlock Hill where it has been growing slowly for ten years and is perfectly healthy, all the earlier attempts to cultivate this tree here having failed. The leaves of the Libocedrus are often browned but are quite green this spring. This tree has been grown here since 1898 and was raised from seeds collected at East Applegate, Oregon. It is not probable that it will ever make in New England a large or valuable tree. It is interesting that one species of the large and important genus Cupressus has lived uninjured on Hemlock Hill during the past winter. This is *Cupressus Macnabiana*, a well known California tree long cultivated in Europe and recently discovered in Oregon. Seeds from an Oregon tree were obtained in 1917 and these seedlings have so far proved perfectly hardy.

Of the few California conifers like the Sugar Pine and the mountain White Pine which are established in the Arboretum few of the trees are confined to the state, the others ranging out of the state north, and often east to the Rocky Mountains. The one exception is one of the two Foxtail Pines, *Pinus Balfouriana*. This is a dwarf, slow-growing tree first discovered on Scott Mountain west of Mt. Shasta in the northwestern part of the state and later on the Whitney Plateau of the southern Sierra Nevada where it forms extensive open forests up to altitudes of 11,500 feet. The Arboretum plant was obtained in 1908 from the Biltmore Nursery in North Carolina. It has grown very slowly but appears perfectly hardy but will never be more in this climate than a curiosity. This is true too of the other Foxtail Pine, *Pinus aristata*, of northern Arizona and New Mexico, and southern Colorado. This tree has been growing in the Arboretum since 1910 when it was obtained from the Hesse Nursery in Germany. *Pinus Balfouriana* is interesting as the only conifer confined exlusively to California which has proved hardy in the Arboretum. In addition to those which grow north and east of the state *Pinus ponderosa* var. *Jeffreyi*, which grows fairly well here, extends from the southern and western Sierra Nevada into Lower California.

The most beautiful conifer introduced into cultivation by the Arboretum is probably *Tsuga caroliniana*. The seeds of this tree were first planted at the Arboretum in 1881 and the trees raised from these seeds are to most people the handsomest conifers in the collection, almost as broad as tall, thickly covered to the ground with gracefully drooping branches, and clothed with leaves dark green above and pale below. It has taken a long time for the beauty of this tree to be really appreciated, and there are few if any cultivated large trees outside of the Arboretum. It is becoming better known, however, every year, and one Massachusetts nursery company can now supply plants of various sizes in great numbers and at reasonable prices.

The Colorado *Picea Engelmannii* of the Rocky Mountains is another

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good introduction of the Arboretum. This is the handsomest of the North American Spruce-trees and the most valuable as a timber tree of them all. At its best it is sometimes one hundred and twenty feet high with a tall trunk often nine feet in diameter, frequently forming great forests up to altitudes of 10,000 to 12,000feet, and is widely scattered above 5000 feet through the whole Rocky Mountain system from Alaska and British Columbia to southern New Mexico and northern Arizona. This tree has been grown in the Arboretum since 1879 when seeds collected by the late Dr. C. C. Parry were sent here from the Pike's Peak region of Colorado. It has grown rapidly in the Arboretum where it has always been perfectly hardy and has formed a narrow columnar head of pale gray-green leaves. Its only defect as an ornamental tree here is the tendency of the older plants to lose their lower branches—an advantage rather than a defect in a tree which will be grown more for the production of timber than for ornament. The loss of the lower branches discloses, too, the exceptionally beautiful gray scaly bark tinged with red.

Picea omorika, the Spruce-tree of southeastern Europe, is the third of the really great conifers introduced by the Arboretum. This is the important Spruce-tree of southeastern Europe where it forms or has formed great forests. Seeds of this tree sent by the late Dr. Carl Bolle of Berlin were planted in the Arboretum in 1881 and have grown into handsome compact pyramids of yellow green leaves pale below. The only drawback to this tree is that the leading shoot is sometimes killed by the insect which destroys the leader of the White Pine (*Pinus Strobus*).

That this Pinetum has done useful work is shown in the case of conifers of wide distribution in demonstrating that the plants raised from seeds gathered in some parts of their range are hardier than in others. The best results of this sort have been obtained perhaps with the handsome and useful Douglas Spruce (*Pseudotsuga taxifolia*). This tree is widely distributed and grows to its largest size on the Pacific coast from southern British Columbia to California. The trees from the coast states have never proved really hardy in the east, but in 1873 and 1874 Dr. Parry sent to the Arboretum from Colorado seeds from which a perfectly hardy race of this tree was raised; and the trees which in late years have been so largely planted in the eastern states have been raised from seeds collected in Colorado.

Almost equally interesting is the so-called Red Cedar, *Thuya plicata,* of the northwest coast region from Alaska to Mendocino County, California, ranging eastward to the western base of the Rocky Mountains in Montana, and in the coast region often growing to the height of two hundred feet and forming a gradually buttressed base often fifteen feet in diameter at the ground level. From these trees the Indians of the coast made their great war canoes, and more recently it has furnished the best material for shingles and the other covering of houses. The coast tree never proved hardy here, but in 1880 one of the Arboretum collectors sent to the Arboretum a small bundle of its seedlings gathered on the mountains of Idaho. These plants have never been injured and have grown well and fairly rapidly, are now all handsome trees and among the most interesting conifers in the collection.

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Probably all of the plants of this tree growing in the eastern states have been propagated by cuttings from the Arboretum trees where there are now four or five good specimens.

The beautiful Silver Fir of the coast, *Abies grandis*, which ranges from northern Vancouver Island to northern California, also extends inland along the mountains of northern Idaho, and some of the Idaho plants have done well here for forty-four years and are in a healthy condition.

Probably, however, the most generally interesting experiment of the sort made by the Arboretum is the one with the Cedar of Lebanon. For centuries it was believed in western Europe that this tree grew naturally only on Mt. Lebanon in Palestine, and all the trees in cultivation were raised from seeds gathered on the Lebanon or from the trees grown from these seeds in England or France, and succeeded in growing to a great size and beauty in these countries. The trees from Palestine were never hardy in New England or really healthy in any part of the eastern states. A comparatively few years ago it was discovered that the Cedar of Lebanon formed forests on the Antitaurus Mountains in Asia Minor about five hundred miles north and in a much colder region than the Lebanon. In 1901 the Arboretum sent a collector from Smyrna to the Antitaurus to collect seeds of the Cedar of Lebanon. He was very successful and sent to the Arboretum a quantity of seeds and a large amount of herbarium material. Much of the seed was distributed at once in the United States and in Europe, but no report from it has ever been received at the Arboretum. The seeds planted here, however, grew well but the trees have grown irregularly in size. The tallest of them are already at least thirty feet high and have grown more rapidly than any seedlings of conifers planted here in the Arboretum. These trees are perfectly hardy, although during one exceptionally severe winter the leaves of a few of them were all killed. A new crop of leaves soon appeared and the growth for that year even does not appear to be at all checked.

It is believed that what is certainly the largest collection of cone-bearing trees and shrubs in the United States is growing in the Arboretum, although it is certain that most of them will never be able to grow here to the size which these trees attain in better soil and a more temperate climate.

The Arboretum offers exceptional opportunities for the student of conifers in its herbarium which is believed to be the best in the world; only the few species already known which occur on the mountains of New Guinea are unrepresented in it.